WHAT IS CLAIMED IS:

1. A non-lasing superluminescent light emitting diode (SLED) comprising a semiconductor heterostructure forming a PN junction and a waveguide defining an optical beam path,

the heterostructure including a gain region and an absorber region in series with the gain region in the optical beam path,

first contact means for applying a voltage to the PN junction in its forward direction in the in the gain region, so as to produce light emission from the gain region and along the optical beam path,

and second contact means contacting the PN junction in the absorber region and operable to remove charge carriers generated by absorption in the absorber region, the second contact means not being connected to an active voltage source,

wherein the waveguide comprises two end facets, the end facets being perpendicular to the optical beam path.

2. A superluminescent light emitting diode according to claim 1, wherein the second contact means are wired so as to keep the PN junction in the absorber region at zero bias.

3. A superluminescent light emitting diode according to claim 1, wherein the PN junction comprises an n-doped side and a p-doped side, and wherein at least one of the n-doped side and the p-doped side is connected, by the second contact means, to a metallic surface outside the heterostructure.

4. A superluminescent light emitting diode according to claim 1, wherein the PN junction in the gain region and in the absorber region is a bulk pn junction comprising a p-doped component and an n-doped component, both having a layer thickness exceeding 10 nm.

5. A superluminescent light emitting diode according to claim 1, wherein the semiconductor heterostructure in the gain region includes a multiple quantum well (MQW) structure and wherein the PN junction is formed in said multiple quantum well structure, or wherein the semiconductor heterostructure in the gain region includes quantum wires or quantum dots.

6. A superluminescent light emitting diode according to claim 1, wherein the waveguide is index guided.

7. A superluminescent light emitting diode according to claim 1, wherein the waveguide is gain guided.

8. A superluminescent light emitting diode according to claim 1, wherein the semiconductor heterostructure comprises a first cladding layer and a second cladding layer, and a PN-junction layered structure between the first and the second cladding layer, the PN-junction layered structure comprising a single quantum well structure or a multiple quantum well structure or a bulk layer of a p-doped material and a bulk layer of an n-doped material, the heterostructure further comprising the first cladding layer being in electrical contact to a first metal electrode, the second cladding layer being in electrical contact to a second metal electrode, the first metal electrode or the second metal electrode or both

metal electrodes being interrupted between the gain region and the absorber region.

9. A superluminescent light emitting diode further comprising detection means for measuring the current made up by said charge carriers' removal in order to obtain a monitoring signal for the output power of the gain region.

10. A superluminescent light emitting diode comprising a semiconductor heterostructure, the semiconductor heterostructure forming a waveguide structure defining an optical beam path and including a gain region, the gain emitting, upon injection of a current through contact means, electromagnetic radiation into the optical beam path, the waveguide structure further including an unbiased PN junction in series with the gain region in the optical beam path.

11. A superluminescent light emitting diode as claimed in claim 10, wherein the waveguide structure comprises two end facets limiting the waveguide structure in a longitudinal direction parallel to the optical beam path, the end facets being perpendicular to the longitudinal direction.

12. A superluminescent light emitting diode as claimed in claim 10 comprising monitoring means for monitoring a photocurrent generated by radiation emitted in the active region and absorbed in the unbiased PN junction, thereby producing a monitoring signal being a measure of the light emitted in the gain region.

13. A superluminescent light emitting diode comprising a semiconductor heterostructure, the semiconductor heterostructure including a first cladding layer, a second cladding layer and an optical beam path arranged between the

first and the second cladding layer, the heterostructure including a light emission arrangement emitting electromagnetic radiation into the optical beam path upon injection of a current, the beam path further including a light absorbing semiconductor arrangement, said light absorbing semiconductor arrangement being connected to a charge carrier reservoir.

14. A superluminescent light emitting diode as claimed in claim 11 wherein said charge carrier reservoir comprises a metallic surface.

15. A superluminescent light emitting diode as claimed in claim 11 wherein the optical beam path in the semiconductor heterostructure is limited by two end facets being perpendicular to the optical beam path.

16. A non-lasing superluminescent light emitting diode (SLED) comprising a semiconductor heterostructure and a waveguide defining an optical beam path,

the waveguide comprising along the optical beam path

a first end facet delimiting the waveguide in the direction of the optical beam path,

an absorber region comprising semiconductor material operable to absorb light travelling along the optical beam path,

a gain region wherein the heterostructure comprises a PN junction and contact means for injecting an electrical current into the PN junction, so as to produce electromagnetic radiation emitted into the optical beam path, and

a second end facet delimiting the waveguide in the direction of the optical beam path, and through which light is coupled out from the waveguide,

wherein the first end the second end facets are perpendicular to the optical beam path.

17. A superluminescent appliance comprising a superluminescent diode with a semiconductor heterostructure, the semiconductor heterostructure including a waveguide structure comprising a first cladding layer, a second cladding layer and an optical beam path arranged between the first and the second cladding layer, the heterostructure including a light emission arrangement emitting electromagnetic radiation into the optical beam path upon injection of a current, the beam path further including a light absorbing semiconductor arrangement, the waveguide structure being delimited, in a direction of the optical beam path, by two end facets being perpendicular to the optical beam path, said superluminescent light emitting diode being housed in a housing that comprises a symmetry axis, where said optical beam path is parallel to the symmetry axis.

18. A superluminescent appliance as claimed in claim 17, wherein said light absorbing semiconductor arrangement comprises a zero biased PN junction.